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EXAMINER

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**BEFORE THE BOARD OF PATENT APPEALS
AND INTERFERENCES**

Application Number: 10/634,269
Filing Date: August 05, 2003
Appellant(s): YAO ET AL.

Sumit Bhattacharya
For Appellant

EXAMINER'S ANSWER

This is in response to the appeal brief filed November 5, 2008 appealing from the Office action mailed September 28, 2008.

I. Real Party in Interest

A statement identifying the real party in interest is contained in the brief.

II. Related Appeals and Interferences

There are no related appeals.

III. Status of Claims

The statement of the status of the claims contained in the brief is correct.

Claims 1-5, 7-14 and 16-32 are pending and rejected. Claims 6 and 15 were previously cancelled. No claims are withdrawn, objected to, or allowed.

No amendments to the claims were made after the Final Office Action dated June 4, 2008.

The claims in their current form (including those claims under appeal) are presented in The Appendix - Section 8 - Claims on Appeal.

IV. Status of Amendments After Final

The appellant's statement of the status of amendments after final rejection contained in the brief is correct.

V. Summary of Claimed Subject Matter

The summary of invention contained in the brief is correct.

VI. Grounds of Rejection to be Reviewed Upon Appeal

The appellant's statement of the grounds of rejection to be reviewed on appeal contained in the brief is correct.

VII. Claims

The copy of the appealed claims contained in the Appendix to the brief is correct.

VIII. Evidence Relied Upon

The following is a listing of the evidence (e.g., patents, publications, Official Notice, and admitted prior art) relied upon in the rejection of claims under appeal:

Cox et al (US 5,644,452)

Cubero Pitel (US 6,160,239)

IX. Grounds of Rejection

A. Are claims 1-4, 10-13, 19-26 and 27-32 anticipated under 35 U.S.C. § 102(b) by Cox et al. (hereinafter "Cox"), (US 5,644,452)?

B. Are claims 5, 7-9, 14 and 16-18 are rendered obvious under 35 U.S.C. § 103 (a) over Cox in view of Cubero Pitel (hereinafter "Cubero Pitel"), (US 6,160,239)?

Regarding Claims 1 and 10, Cox et al shows (Figs. 1-3) a system for a magnetic head arm assembly (HAA) comprising: a first component (14 – including ground run 22) having a first cavity (21) to be coupled to an arm portion (16) having an arm cavity (20) via insertion of a pin element (18), independent of the first component and the arm portion, through the first cavity and the arm cavity and welded (*to join (metals) by applying heat, sometimes with pressure and sometimes with an intermediate or filler metal having a high melting point*) between said first component and said arm portion, wherein the surface of said pin element is **directly attached to and physically connected** (the pin 18 is directly attached to along a surface of said first component (flex cable 14) on ground run surface 22 by the solder, and is press fitted into hole 20

of arm portion 16 – Col 3, line 37)) and a surface of said arm portion, wherein said first component (14) is selected from the group consisting of a head suspension portion (54) and a flex cable portion (14).

Regarding Claims 2 and 11, Cox et al shows (Figs. 1-3) the system, wherein said head suspension portion (54) is a hard disk drive head gimbal assembly (HGA) - (Col 4, line 67).

Regarding Claims 3 and 12, Cox et al shows (Figs. 1-3) the system, wherein said flex cable portion (14) is a hard disk drive (Abstract and Col 1, lines 13-19) flex cable.

Regarding Claims 4 and 13, Cox et al shows (Figs. 1-3) the system, wherein said arm (14) portion is a hard disk drive (Col 1, lines 16-20) arm.

Regarding Claims 19 and 27, Cox et al shows (Figs. 1-3) a system for a magnetic head arm assembly (HAA) comprising: a first component (50) to be coupled to a second component (62) having an arm cavity (44) via a pin (42) independent of the first component and the second component and welding said first component to said second component, wherein said first component is selected from the group consisting of a head suspension portion (54), a flex cable portion (62), and a flex circuit portion (62), and said second component is an arm portion (52).

Regarding Claims 20 and 28, Cox et al shows (Figs. 1-3) the system, wherein said first component is a hard disk drive slider frame (Col 4, line 67; a frame supporting the slider is inherent to a HAA) and said second component is selected from a group consisting of a hard disk drive head gimbal assembly (HGA), and a hard disk drive slider (Col 4, line 67; a slider holding the transducer head is inherent to a HAA)

Regarding Claims 21 and 29, Cox et al shows (Figs. 1-3) the system of claim, wherein said head suspension portion (54) is a hard disk drive head gimbal assembly (Col 4, line 67).

Regarding Claims 22-24, and 30, Cox et al shows (Figs. 1-3) the system, wherein said flex cable portion (62) is a hard disk drive flex cable, said flex circuit portion (62) is a hard disk drive bridge flex circuit (BFC – flex circuit (62) bridges the connection), and said arm portion is a hard disk drive arm (Abstract).

Regarding Claim 25,26,31, and 32, Cox et al shows (Figs. 1-4) wherein said first component is coupled to said second component via a type of welding selected from the group consisting of ultrasonic welding, solder bump welding, and laser welding (Col 3, line 52).

Claims 5,7-9,14, and 16-18 are rejected under 35 U.S.C. 103(a) as being unpatentable over Cox et al (US 5,644,452) in view of Cubero Pitel (US 6,160,239).

Regarding Claims 5,9,14, and 18, Cox et al shows all the features described, *supra*, but does not show a copper welding pin interference fitted into a first cavity and into the arm cavity to couple the first component to the arm portion.

Pitel shows (Figs. 4-6) a copper welding pin (21 – Col 1, line 53) interference fitted into a first cavity and into the arm cavity to couple the first component to the arm portion.

It would have been obvious to one of ordinary skill in the art at the time the invention was made to couple the first component to the arm portion of Cox et al using the copper welding pin as taught by Cubero Pitel. The rationale is as follows: One of ordinary skill in the art at the time the invention was made would have been motivated to couple the first component to the arm portion of Cox et al using the copper welding pin as taught by Cubero Pitel in order to secure two substrates together with art recognized equivalent methods (soldering welding, application of heat).

Regarding Claims 7,8,16, and 17, **Official Notice** is taken that holes and recessions can be of circular and rectangular shape, and other various shapes.

It would have been obvious to one of ordinary skill in the art at the time the invention was made to shape a hole to be circular or rectangular. The rationale is as follows: One of ordinary skill in the art at the time the invention was made would have been motivated to shape a hole to be circular or rectangular in order to match the shape of the pin for insertion.

X. *Argument*

Issue No. 1: Whether claims 1-4, 10-13, 19-26 and 27-32 are anticipated by Cox.

Issue No. 2: Whether claims 5, 7-9, 14 and 16-18 are rendered obvious under 35 U.S.C. § 103 (a) over Cox in view of Cubero Pitel.

XI. *Response to Arguments*

1. Whether claims 1-4, 10-13, 19-26 and 27-32 are anticipated by Cox.

Group #1: Claims 1-4, 10-13, 19-26 and 27-32

Appellant's argument on Pages 5 and 6:

“ Applicants respectfully submit the cited references do not teach or suggest at least a system for a magnetic head arm assembly wherein the surface of a pin element is directly attached to and physically connected along a surface of a first component and a surface of an arm portion (e.g., as described in claim 1).

Such a feature is neither shown nor suggested by the cited Cox reference. See e.g., cited Figs. 1 and 2. In Figure 1, the cited pin element (18) is not directly attached to either the cited first component (14) or the cited arm component (16); the cited pin element (18) is instead inserted through the guide hole 21 and hole 20, precluding direct attachment and physical connection. Similarly, in Figure 2, the guide hole 46 and hole 44 prevent the direct attachment or physical connection of a pin surface along the surface of a first component or the surface of an arm portion. The Examiner asserts the pin 18 is directly attached to and along a surface of a first component (flex cable 14) on ground run surface 22 by the solder, and is press fitted

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into hole 20 of arm portion 16. See Office Action dated 6/4/2008, paragraph 3. Appellants disagree for at least reasons described above, and submit the description of Cox supports Appellants' position as well. For example, column 3, lines 32-44 states: "Each solder joint 12 includes a pin 18 inserted into hole 20 in rotary arm 16. Each hole 20 can be drilled into rotary arm 16 at a cost which is cheaper to produce than the tapped holes required to secure flex cable 14 to rotary arm 16 with a screw. Pin 18 is pressed into hole 20 in rotary arm 16. Flex cable 14 includes a guide hole 21 for receiving each pin 18 when flex cable 14 is properly aligned adjacent to rotary arm 16. Hole 21 is preferably larger in area than hole 20 so that pin 18 can easily fit through it. In preferred embodiments, a solder pad is placed around hole 21. After flex cable 14 is placed over pin 18, it can be soldered in place, thus securing flexible cable 14 to rotary arm 16." This section describes pin 18 is pressed into hole 20, and that hole 21 is larger than hole 20. Therefore, if pin is pressed into hole 20, and hole 21 is larger than hole 20, it stands to reason that pin 18 is not directly attached to and physically connected to alleged first arm portion 14 - as shown in Figure 1 and as argued above. As such, Figure 1 clearly shows that pin 18 is not directly attached to and physically connected to at least the alleged first arm portion 14. Therefore, the current rejection is lacking."

The Examiner maintains that pin (18) is clearly shown to be "directly attached" and "physically connected" to a first component (14) by the solder joint (12). It stands to reason, if this were not the case, the pin would fail to hold the first component to the rotary arm (16).

The dictionary defines "attached" as *to fasten or affix; join; connect: to attach a photograph to an application with a staple.*

Looking closely at Figure 1, pin (18) is "directly attached", fastened, or affixed to first component (14) by solder joint (12). Cox discloses in Column 3, lines 65-67 and Column 4, lines 1-8 that pin (18) is soldered to first component (14) and pressed fit into rotary arm (16) providing a consistent ground reference. In order to provide a solid ground in the electrical connection, the structures must be physical connected and directly attached. Also, pin (18) is "press fit" into hole (20) of rotary arm (16) which inherently, physically connects the pin to the rotary arm.

2. Whether claims 5, 7-9, 14 and 16-18 are rendered obvious under 35 U.S.C. § 103 (a) over Cox in view of Cubero Pitel.

Group #2: Claims 5, 7-9, 14 and 16-18

Appellant's argument on Page 7:

“Cubero Pitel fails to make up for the deficiencies of Cox. Cubero Pitel is directed toward a laser soldering procedure applicable to the joining of pins over printed circuit boards. However, it does not describe at least these relevant limitations of claim 1 anywhere; independent claims 10, 19, and 27 recite similar limitations that are not found in the Cubero Pitel as well.”

The Examiner maintains that Pitel shows (Figs. 4-6) a copper welding pin (21 - Col 1, line 53) interference fitted into a first cavity and into the arm cavity to couple the first component to the arm portion.

It would have been obvious to one of ordinary skill in the art at the time the invention was made to couple the first component to the arm portion of Cox et al using the copper welding pin as taught by Cubero Pitel. The rationale is as follows: One of ordinary skill in the art at the time the invention was made would have been motivated to couple the first component to the arm portion of Cox et al using the copper welding pin as taught by Cubero Pitel in order to secure two substrates together with art recognized equivalent methods (soldering welding, application of heat).

Regarding Claims 7,8,16, and 17, Official Notice is taken that holes and recessions can be of circular and rectangular shape, and other various shapes.

It would have been obvious to one of ordinary skill in the art at the time the invention was made to shape a hole to be circular or rectangular. The rationale is as follows: One of ordinary skill in the art at the time the invention was made would have been motivated to shape a hole to be circular or rectangular in order to match the shape of the pin for insertion.

The Examiner emphasizes that Cubero Pitel discloses affixing structures together by melting (soldering or welding) dissimilar metals together using a metal pin. Not only is a similar structure disclosed, but the process of affixing is similar and would motivate one of ordinary skill in the art to combine the teaching of both references to secure a first component and an arm portion together with a pin element.

XII. Related proceedings

No decision rendered by a court or the Board is identified by the examiner in the Related Appeals and Interferences section of this examiner's answer.

For the above reasons, it is believed that the rejections should be sustained.

Respectfully Submitted,

/Mark Blouin/

Primary Examiner of Art Unit 2627

Mark S. Blouin
Art Unit 2627

MSB
December 16, 2008

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